

The **American Fertilizer**

Vol. 96

JANUARY 3, 1942

No. 1



• •
NITRATE of SODA

•
SULPHATE of AMMONIA

•
ORGANIC AMMONIATES

•
SULPHUR
• •



ASHCRAFT-WILKINSON CO.

**VEGETABLE OIL MEALS
AND
FEEDSTUFFS**

Exclusive Distributors Duval Texas Sulphur

HOME OFFICE
ATLANTA, GA.
Cable Address: ASHCRAFT

OFFICES
**CHARLESTON, S. C.
NORFOLK, VA.**

LOW-COST CROP INSURANCE!

Include 20 MULE TEAM Borax in Fertilizers for All Field and Truck Crops

NOT all soils are acutely deficient in boron, that element in borax essential to plant growth. In fact, in the larger and more important number of cases, crops may not show definite symptoms of boron deficiency, yet benefit distinctly from applications of borax, both quality and quantity being improved. Since, under field conditions, it is often difficult to predetermine whether sufficient boron will be available during a growing season, agricultural experts now recommend that borax be applied annually to field and truck

crops in small amounts which will not build up boron toxicity in the soil or injure boron-sensitive plants. Even if response is not noted in every year, small amounts of borax cost so little, they may be applied regularly with profit.

Increasingly, manufacturers are now including Twenty Mule Team Borax in the mix to supply boron as recommended by local agricultural authorities. They know that the famous Twenty Mule Team trademark is their assurance of uniformity and quality.

PACIFIC COAST BORAX COMPANY

New York • Los Angeles



Stop Figuring!

There's an easier way to find the desired per cent.
of constituent in complete goods—you can get it
at a glance by consulting

ADAMS' FORMULA RULE

Hundreds in use, and claimed indispensable by
every owner.

The Adams' Formula Rule, pocket size, may be carried for years. When soiled it is readily cleaned with a damp cloth. **Price, \$1.00.** Kindly remit with order.

(Special quotations on quantities of 12 or more)

WARE BROS. COMPANY

1330 Vine Street

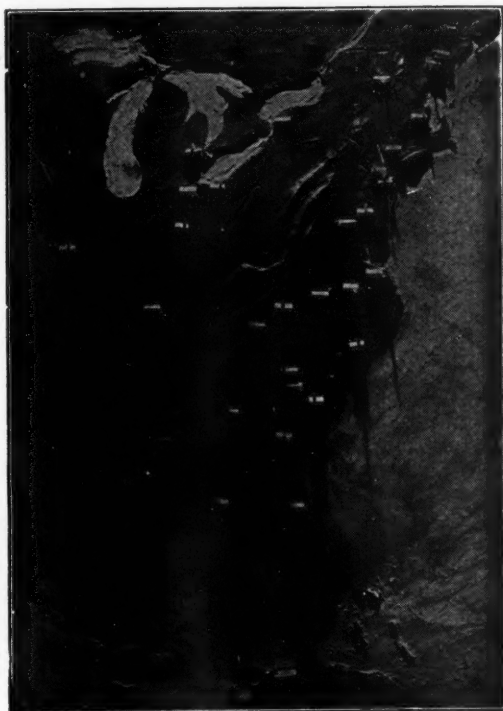
PHILADELPHIA

Published every other Saturday. Annual subscription: In the United States, \$3.00; Canada and Mexico, \$4.00; other countries, \$5.00. Entered as second-class matter, January 15, 1910, at the Post Office at Philadelphia, Pa., under Act of March 3, 1879. Registered in United States Patent Office. Publication office, 1330 Vine St., Phila., Pa.

A Complete Service

THE strategic factory locations of the American Agricultural Chemical Company, as shown on the accompanying map, assure prompt, dependable service for the complete line of products listed below.

We manufacture all grades of Commercial Fertilizers, Superphosphate, Agrinite Tankage, Bone Black, Bone Black Pigments (Cosmic Black), Dicalcium Phosphate, Monocalcium Phosphate, Gelatin, Glue, Ground Limestone, Crushed Stone, Agricultural Insecticides (including Pyrox, Arsenate of Lead, Calcium Arsenate, etc.), Trisodium and Disodium Phosphate, Phosphorus, Phosphoric Acid, Sulphuric Acid, Salt Cake; and we are importers and/or dealers in Nitrate of Soda, Cyanamid, Potash Salts, Sulphate of Ammonia, Raw Bone Meal, Steamed Bone Meal, Sheep and Goat Manure, Fish, Blood and Tin-Tetrachloride. We mine and sell all grades of Florida Pebble Phosphate Rock.



FACTORIES

| | | |
|-------------------|----------------------|-----------------------|
| Alexandria, Va. | Detroit, Mich. | Pensacola, Fla. |
| Baltimore, Md. | East Point, Ga. | Pierce, Fla. |
| Buffalo, N. Y. | East St. Louis, Ill. | Port Hope, Ont., Can. |
| Carteret, N. J. | Greensboro, N. C. | Presque Isle, Me. |
| Cayce, S. C. | Havana, Cuba | Savannah, Ga. |
| Chambly Canton, | Henderson, N. C. | Searsport, Maine |
| Quebec, Can. | Montgomery, Ala. | South Amboy, N. J. |
| Charleston, S. C. | Norfolk, Va. | Spartanburg, S. C. |
| Cincinnati, Ohio | No. Weymouth, | West Haven, Conn. |
| Cleveland, Ohio | Mass. | Wilmington, N. C. |

The AMERICAN AGRICULTURAL CHEMICAL Co.

50 Church Street, New York City

SALES OFFICES



| | | | |
|-------------------|----------------------|------------------------|-----------------------|
| Alexandria, Va. | Columbia, S. C. | Houlton, Me. | Pensacola, Fla. |
| Baltimore, Md. | Detroit, Mich. | Laurel, Miss. | Pierce, Fla. |
| Buffalo, N. Y. | East Point, Ga. | Montgomery, Ala. | Port Hope, Ont., Can. |
| Carteret, N. J. | East St. Louis, Ill. | Montreal, Quebec, Can. | St. Paul, Minnesota |
| Charleston, S. C. | Greensboro, N. C. | New York, N. Y. | Savannah, Ga. |
| Cincinnati, Ohio | Havana, Cuba | Norfolk, Va. | Spartanburg, S. C. |
| Cleveland, Ohio | Henderson, N. C. | No. Weymouth, Mass. | Wilmington, N. C. |

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.



"TRONA" POTASH

Trona Muriate of Potash is now being used from coast to coast. Uniformity—excellent mixing qualities—prompt deliveries—have contributed to the increasing popularity of this American product.

Manufacturers of Three Elephant Borax and Boric Acid
See Page 25

Branch Offices: 214 Walton Building
ATLANTA, GEORGIA

542 Conway Building
CHICAGO, ILLINOIS

600 South Grand Avenue
LOS ANGELES, CALIF.

AMERICAN POTASH & CHEMICAL CORPORATION
70 Pine Street New York City

TRONA

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

... THE ...

AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

Vol. 96

JANUARY 3, 1942

No. 1

Fertilizer Industry Adjustments During the Emergency

By T. E. MILLIMAN

Chief, Agricultural Chemicals Unit, Office of Price Administration, Washington, D. C.

An address before the National Fertilizer Association Convention, Atlanta, Georgia, November 19, 1941

AS the fertilizer industry comes together at this appropriate meeting place in the center of the general area of its greatest activity, it faces one of the most critical prospects in the history of what is now almost entirely a chemical business. The 1942 needs of the vital food crops, and of farm production in general, are fairly well assured. Mild shortages of regional character may appear, but unless our Nation finds it necessary this winter to set aside some of its domestic necessities in favor of an all-out war effort at any cost, it is unlikely that fundamental readjustments and curtailments will be necessary until after 1942 crops are planted.

There is no part of the fertilizer industry unaffected by the war. Time need not be wasted here identifying nitrogen and sulphuric acid as primary war materials, nor is it necessary to emphasize the growing importance of phosphorus as a munition. The critical transportation problems on sulphur, phosphate rock and to a lesser extent potash, are problems not alone of the fertilizer industry, but of Government also. Burlap, cotton, and paper bags—their availability and their prices—are common problems of industry and Government, as is also the maintenance of a line of plant equipment which is peculiarly susceptible to loss from corrosion as well as wear.

This fertilizer industry is concerned with Government not only on the availability and prices of materials, transportation and supplies, but also with any crisis that may arise from

which a requirement will come to divert fertilizer to the enlarged production of certain crops.

With these facts in mind, the U. S. Department of Agriculture and the Office of Price Administration recently, through Mr. Leon Henderson, extended invitations to some 40 fertilizer executives fairly representative of the industry as to materials, and equally so as to size, type, and geographical location of mixers, to meet in Washington. These men came and spent an entire day with representatives of three branches of Government: the Department of Agriculture, the Office of Production Management, and the Office of Price Administration.

Information was exchanged, critical problems evaluated, and a better understanding was reached upon the objectives of Government concerning the needs of the whole people in relation to the needs and responsibilities of the fertilizer industry. The industry representatives were encouraged to express their views concerning the selection of an industry committee to work with Government.

Here it should be recorded that a ruling of the Attorney General's Office requires that industry committees, created to serve during the emergency, must be appointed by Government.

At the Washington meeting of October 23rd, the belief was general among fertilizer executives that a small industry committee should be selected as a consulting group to Government and as a means of expressing the industry's views to Government. Most of the executives

who expressed views as to the size of a working or consulting group favored a very small committee.

Some days later, Government men met and selected a group of men to whom invitations are being sent, to serve as an industry consulting committee. In the effort of Government to obtain a reasonably accurate cross-section of the industry as to type, size, and location, the result was a slightly larger committee than the industry itself seemed to prefer.

Those who are being invited to serve the industry and the Government, without compensation for time or travel, are:

Nitrogen, Sidney D. Haskell, The Barrett Co., New York; also J. A. Woods, Chilean Nitrate Sales Corp., New York.

Phosphate Rock, John T. Burrows, International Agricultural Corp., Chicago.

Sulphuric Acid, Louis H. Carter, The American Agricultural Chemical Co., New York.

Superphosphate, Chester F. Hockley, The Davison Chemical Corp., Baltimore, Maryland.

Potash, Horace M. Albright, U. S. Potash Company, New York.

Large Fertilizer Companies, John E. Sanford, Armour Fertilizer Works, Atlanta, Ga.

Medium Fertilizer Companies, Oscar F. Smith, Smith-Douglass Company, Norfolk, Va.

Small Fertilizer Companies, John A. Miller, Price Fertilizer Co., Louisville, Ky.; also W. B. Tilghman, W. B. Tilghman Co., Salisbury, Md.; C. D. Shallenberger, Shreveport Fertilizer Works, Shreveport, La.; George Cushman, Long Island Produce & Fertilizer Co., Riverhead, L. I.

For the Pacific Coast, Weller, Noble, Pacific Guano Co., Berkeley, Calif.

Cooperatives, M. H. Lockwood, Eastern States Farmers' Exchange, Springfield Mass.; also M. K. Derrick, Indiana Farm Bureau Cooperative Association, Indianapolis, Ind.

Ex-officio Member, Charles J. Brand, Secretary, The National Fertilizer Association, D. C.

In choosing this list of men who will be invited to serve their country, Government believes that excellent choices have been made. Those of us who are concerned in Government with fertilizer matters, whether on temporary appointment or in permanent positions, do not, however, take the attitude that any one of the men just named is irreplaceable, or that an equally good committee of different composition could not have been created.

No outside influences, whether political, industrial or of any other kind, were brought

to bear upon Government men in the selection of this committee.

Should fertilizer problems continue to be acute or become more so, as now seems likely, it is reasonable to suppose that sub-committees may at times be formed, either from the committee itself or from the original panel of 40 men (from which the committee was selected)—or from the industry generally. If this latter should happen, it is supposed that one or more of the committee would serve on sub-committees.

In issuing this invitation to serve, Mr. Henderson has, with the understanding of other branches of Government, indicated an early meeting at Washington. Although of long experience in committee development and action, I am new in Government work, and therefore hope that I am not brash in making the statement that members of the committee itself will be expected to indicate as much as do Government men the subjects upon which the committee will confer with Government. These subjects can be as broad and ramified as is the fertilizer industry itself.

The Problem of Low-Analysis Fertilizers

In the light of today's need for full use of the Nation's man-power, equipment and supplies, we can face an old, old problem—that of inert fillers—from a new vantage point. This problem is still with us in 1942 because the habits and customs of farmers, fertilizer agents, salesmen, and the mixing industry itself did not move upward as rapidly as did the concentration or percentages of plant food in fertilizer materials.

Sales customs and practices have not kept pace with the technology of the nitrogen, superphosphate and potash industries. As a result we are using measurable amounts of labor, equipment, plant space, power, transportation, and packages which could be saved for other vital national uses. More than that, we are taking up more space in local agents' warehouses than is necessary. At the same time, we are permitting farmers to do more lifting, tugging, grunting, and groaning to apply fertilizers at a higher cost per unit of plant food than is available in the medium grades or analyses produced by all companies.

How may this situation be corrected? Corrected not only for reasons of the present great emergency, but for economy to the farmer, as well as for the fertilizer industry's long-time best interests? It is a known fact that farmers will apply more plant food when it is of medium

concentration and at lower cost per unit. To bring agriculture and the selling habits of an industry up to the level of the technology of that industry is no simple task. Nor is it one which fertilizer manufacturers alone can handle. Clear-cut educational material, designed for use among farmers, local dealers, and agents, and among fertilizer salesmen, is definitely required.

To develop and operate an educational campaign of this magnitude requires the combined resources of the U. S. Department of Agriculture, state colleges and experiment stations, county agricultural agents, high school and secondary teachers of agriculture, big and little fertilizer companies, the Office of Production Management and the Office of Price Administration. All of us who serve the farmer can, in the next six months, by pushing our shoulders hard against the wheel, make real gains on this old problem.

In the industry are many manufacturers of complete fertilizer who genuinely desire to have useless and inert fillers completely eliminated. Others, including a few small mixers who by virtue of location can make competitive freight and labor savings on inert filler materials, are content with the status quo. I hope that the industry's consulting committee to Government will find the opportunity to constructively analyze the opportunities at an early date. If our combined efforts take hold, one of our problems of 1942, somewhat ironically, may be to urge farmers to reduce applications to crops in plentiful supply, when medium grades are substituted for low grades, while fertilizing heavily the vital food crops of national need. Proper educational efforts should go far toward solving this problem.

If our National need for everything useful grows greater, it may become necessary for some type of National Government action to be taken against the use of inert fillers. As a farmer, a former fertilizer executive, and now as a government man, I am against such procedure—at least until the industry has had an opportunity to cooperate with public agencies in a combined drive to correct this waste. If such a drive should fail, I hope that Governmental action will be taken then in conformity with the majority opinion of the industry as to ways and means. The objective is entirely justifiable and desirable.

What Price Fertilizer?

The price levels at which fertilizer and fertilizer materials moved to the farms during the spring and fall of 1941 were within the reach of most classes of farmers. Moving back from

the farms to the local dealers or agents, we find that, for the most part, normal retail margins prevailed. There was little or no profiteering here.

Moving back further, from the dealer to the factory, the price situation that prevailed allows the statement that here, too, normal margins for production, overhead, and selling costs were the rule.

Moving all the way back to the essential materials, we find that prices of nitrogen and potash were reasonable. And mixers who do not produce superphosphate were able to buy from their larger competitors within limits which permitted free competition with acidulators, who also sell complete fertilizer. It is expected by the Office of Price Administration that this situation should continue to prevail.

I wish here to express appreciation to steel and coke producers, and to handlers of sulphate of ammonia, who have continued to maintain the \$28 and \$29 prices requested by Administrator Henderson in his letter of May 22nd. This product is the largest single source of fertilizer nitrogen and is produced by many companies.

The general adherence to the \$28 and \$29 prices requested by Administrator Henderson, and to the \$30 price for spot goods, makes more conspicuous the few—chiefly resellers of various kinds—who have obtained, or who attempted to obtain, higher prices reaching up as far as \$40 for bagged goods at ports.

These men have contributed nothing to Defense, to Agriculture, or to the stability of the fertilizer industry. Instead, they have placed a handicap upon the small mixers who bought from them, and have added to the cost of complete fertilizers to farmers. Moreover, these speculators in sulphate of ammonia, who sought to line their own pockets without contributing any primarily essential service, are a thorn in the sides of producers and the handlers who have rendered, at moderate margins, a constructive and useful distributing service.

The Office of Price Administration is alert, and will continue to be alert, to the actions of that small portion of the fertilizer trade that seeks to capitalize for its own benefit on speculative opportunities occasioned by the confusion, stresses, and strains of our great Democracy arming itself for its preservation. The runaway markets of the first world war, in nitrogen materials, in potash, and even in superphosphate, are unnecessary now.

We recognize that there may be a temptation,

(Continued on page 20)

Utilization of Sea Water for Potash Production

THE great potash resources that in the past have supplied the world's requirements are the bedded deposits of Germany, France, Poland, Spain, Russia, and, more recently, the United States. Not much of the potash of Europe moves very far from its base of supply now that the countries are embroiled in war. Scientists of several of the countries in which no potash is found have experimented from time to time trying to invent methods of extracting it from sea water in commercial quantities. These attempts have been made not so much because there is such a relatively large quantity to be had from sea water (only 5 parts of K_2O equivalent in 10,000 of sea water) but because there is so much sea water available. Bromine is found in sea water in even smaller quantity (less than 1 part in 10,000), yet a method has been devised to extract it commercially, as at the plant near Wilmington, N. C.

Previous to the development of the bedded potash deposits and the recovery of potash salts from the brines of lakes and marshes in the western part of the United States, it was thought by some operators that potash might be recovered profitably from the bitterns of the solar-salt plants on the Pacific Coast that use sea water, but no commercial undertaking resulted.

Norwegian Process

About the most recent of the foreign developments noted by the Bureau of Mines is a Norwegian process that reached the pilot-plant stage in 1940. This process, which was patented by the Norsk Hydro Elektrisk Kvaelfstof A. S., disclosed that dipicrylamine (hexanitrodiphenylamine) would act as a selective agent to extract the potash from the sea water, making a compound from which the potash could be recovered and the precipitant regenerated for re-use. It is understood that the patent specification (No. 22,025) describing the properties and uses of the precipitant for potash recovery became open to public inspection under the International Patents convention. Briefly, the method is as follows:

When a dipicrylamine—whether calcium, sodium, lithium, or magnesium—is added to sea water, it forms immediately the water-insoluble potassium dipicrylamine, and that

precipitates while the other constituents remain in solution. After the solution is filtered off, the next step has the double purpose of obtaining the potassium and recovering the reagent from the remaining filter cake. For this the filter cake is treated with nitric, sulphuric, or hydrochloric acid, which dissolves out the potassium and forms a potassium salt of the acid used, leaving behind the dipicrylamine crystals.

Calcium dipicrylamine is the preferred precipitant, although sodium, lithium, or magnesium salt may be used.

The specification describes the different steps and the best procedure and gives an example in which 420 grams of dipicrylamine was dissolved in 8 liters of milk of lime, with a calcium oxide content of 27 grams. The solution was filtered and added to 100 liters of sea water containing about 73 grams of potassium chloride, while stirring, at 16 to 18° C. A red crystalline mass separated out, was filtered after 15 minutes, and washed with water. The filter cake, of which 78 per cent was potassium dipicrylamine, the balance being water, weighed 435 grams. This filter cake was then treated, while stirring, at 20° C., with 270 cc. of 14 per cent nitric acid for about three-quarters of an hour. After filtration and washing, the quantity of potassium nitrate in the solution corresponded to a conversion of 93 per cent of the nitric acid used, but with a systematic treatment of the salt with nitric acid, practically complete conversion can be obtained. To the original filtrate of 108 liters, containing unconverted calcium dipicrylamine, there was added such a quantity of 47 per cent nitric acid that a pH of 3.6 was obtained. This caused precipitation of the excess dipicrylamine.

Another example describes the application of the process to recover 5,000 tons of K_2O a year from sea water, according to which 1,750 cubic meters of sea water containing 0.43 kg. of K_2O per cubic meter are pumped per hour into a tank to which is added, per hour, 50 cubic meters of a solution of calcium dipicrylamine containing 5.6 tons of dissolved dipicrylamine. Approximately 75 per cent of the potash content is precipitated, corresponding to 0.57 ton K_2O an hour.

Japanese Process

A number of attempts have been made in Japan to obtain potassium salts of various kinds from sea water but details are not available at present. In 1932 a United States Trade Commissioner assigned to Tokyo reported that the Japan Iodine Co. had begun the manufacture of potassium chlorate at Hirota, Fukushima Prefecture, in a plant leased from the Japan Chemical Co. and the Tobu Electric Co. for 10 years. The production then was reported to be 220 barrels of 50 kilograms each per day, and it was anticipated that they would soon be able to produce 300 barrels per day. The Bureau of Mines, however, has no late information regarding it.

In 1936 it was reported that the Nippon Denki Kogyo K. K. (Japan Electrical Industrial Co.) had completed its plant at Yokohama to produce potassium hydroxide and chlorine products. It had a daily capacity of 28 metric tons of potassium hydroxide, and the production then was about 22 tons daily.

In the same year a Tokyo professor obtained a patent to utilize the bitterns from the manufacture of common salt from sea water to obtain potassium. The process was said to be one of treating the brines with aluminum sulfate to yield a commercial potassium sulphate, the aluminum sulphate being recovered for further use.

Italian Process

Other processes have been designed to utilize the bitterns of the residue after extraction of sodium chloride from the sea water. The Niccoli method possibly is one of the most outstanding of such processes. The process was used first experimentally at Naples, Italy, and later on a commercial scale in the Italian Colonies of Africa, in the hope of supplying Italy with its potash requirements, which that country has to import. Enrico Niccoli, who described his process in *Chimie & Industrie*, 1936 (18, pp. 557-563), said the installation was intended to deal with the whole of the mother liquors from the salt-extraction works, which could produce up to 100,000 metric tons of salt annually. This would mean a possible production of about 3,000 tons of potash salts containing up to 50 per cent potassium sulphate.

The process has three stages—two chief stages and one not absolutely necessary. First the bitterns at 30° Bé are concentrated by solar heat in a series of pans up to 35° to 37° Bé, the impure sodium chloride deposited at a lower concentration being removed. At this

density a mixed salt called mellahite is deposited. Because of changes in physical conditions such as wind and temperature, the composition of the deposited "mellahite" is not absolutely constant. However, it ranges about as follows: 18 to 21 per cent potassium chloride, 17 to 22 per cent sodium chloride, 29 to 33 per cent magnesium sulphate, and 2 to 4 per cent magnesium chloride. The composition of the mellahite has an effect on the purity of the final product.

Second, after the mellahite has been left heaped on the ground for several months it is ground, weighed, and then taken to refineries and washed by sea water of suitable concentration and temperature to produce schoenite ($K_2SO_4 \cdot MgSO_4 \cdot 6H_2O$). The wet schoenite is then centrifuged and the wash water driven off, resulting in a schoenite product containing about 38 per cent potassium sulphate besides 1 per cent potassium chloride and magnesium sulphate, and some sodium chloride. Passing to a dehydrator at a temperature of 170° C. the water of crystallization is removed.

The composition of the Niccoli potash salts produced is compared with that of the German potash fertilizer Kalimagnesia in the following table:

| | Niccoli potash salts | Kalimagnesia |
|------------------------------------|-------------------------|--------------|
| Potassium sulphate (K_2SO_4).. | 51.0 | 50.4 |
| Magnesium sulphate ($MgSO_4$) | 37.0 | 28.0 |
| Sodium chloride ($NaCl$)..... | 3.1 | 3.5 |
| Calcium sulphate ($CaSO_4$).... | ... | 3.4 |
| Water | 4.6 | 7.1 |
| Insoluble | 3.0 | 7.6 |

If the third stage is used, it intercepts the process before the schoenite goes to the dehydrator. The schoenite is dissolved in fresh (nonsalty) water. Milk of lime is added to precipitate the magnesia, together with the calcium sulphate; the potassium sulphate remains in solution. By evaporation a product ranging up to 95 to 96 per cent K_2SO_4 can be recovered from the solution. At some places where fresh water is not obtainable this stage is omitted.

In this process the degree of commercial success depends on climatic conditions, the most favorable places for its use being those with high temperatures and the right winds. Another advantage would be proper natural slopes, which would permit an inexpensive gravity system to be used.

The Niccoli process, it is understood, was operating successfully in 1939, but the Bureau of Mines has no later definite information about it.

THE AMERICAN FERTILIZER

ESTABLISHED 1894

PUBLISHED EVERY OTHER SATURDAY BY
WARE BROS. COMPANY
1330 VINE STREET, PHILADELPHIA, PA.

A MAGAZINE INTERNATIONAL IN SCOPE AND CIRCULATION
DEVOTED EXCLUSIVELY TO THE COMMERCIAL FERTILIZER
INDUSTRY AND ITS ALLIED INDUSTRIES

PIONEER JOURNAL OF THE FERTILIZER INDUSTRY

WARE BROS. COMPANY
PUBLISHERS

1330 VINE STREET PHILADELPHIA, PA.

A. A. WARE, EDITOR

ANNUAL SUBSCRIPTION RATES

| | |
|--|--------|
| U. S. and its possessions, also Cuba and Panama..... | \$3.00 |
| Canada and Mexico | 4.00 |
| Other Foreign Countries | 5.00 |
| Single Copy | .25 |
| Back Numbers | .50 |

THE AMERICAN FERTILIZER is not necessarily in accord with opinions expressed in contributed articles that appear in its columns. Copyright, 1941, by Ware Bros. Company.

Vol. 96 JANUARY 3, 1942 No. 1

Principal Articles in This Issue

| | PAGE |
|---|------|
| FERTILIZER INDUSTRY ADJUSTMENTS DURING THE EMERGENCY..... | 5 |
| UTILIZATION OF SEA WATER FOR POTASH PRODUCTION | 8 |
| Fertilizer Defense Committee Discusses Material Requirements | 10 |
| WHAT HAS A SALESMAN THE RIGHT TO EXPECT FROM HIS SALES MANAGER?.... | 12 |
| FERTILIZER MATERIALS MARKET: | |
| New York | 13 |
| Baltimore | 13 |
| Chicago | 15 |
| Charleston | 15 |
| Philadelphia | 16 |
| Allocation of Burlap Ordered by O.P.M. . | 16 |
| International Develops Expansion Program | 22 |

Fertilizer Defense Committee Discusses Material Requirements

The first fertilizer industry defense meeting following the declaration of war, with its tremendous impact on our national life, was a meeting of the Subcommittee on Superphosphate and Sulphuric Acid held on December 18th. The meeting was presided over by Philip H. Groggins, OADR, and was attended also by L. H. Carter, Bayless W. Haynes, Chester F. Hockley, and Maurice H. Lockwood, members of the subcommittee; T. E. Milliman, Page B. Blackmore, Cedric G. Gran, R. G. Phelps, and Willard C. Mills, OPA; K. D. Jacob, USDA; Herbert H. Meyers, OPM; and D. S. Murph, NFA.

It was reported that, based on the replies to a questionnaire on superphosphate production sent out through the National Fertilizer Association, and factors such as the desire for increased production of foodstuffs, estimated requirements of superphosphate to be made with sulphuric acid in 1942 would be 6,362,000 equivalent short tons of 16 per cent superphosphate. The figures include 150,000 tons to take the place of superphosphate made in 1941 by TVA with furnace acid, which in turn was made from elemental phosphorus. Probably no elemental phosphorus will go into fertilizer in 1942. The estimate covers the requirements for this country, including AAA, TVA farm test demonstrations, and for export. Though the figures as to 1942 needs represent considerable increase over 1941 production, doubt was expressed as to whether 1942 production would actually exceed that for 1941.

The most important limiting factor in the production of superphosphate is the supply of sulphuric acid. It is estimated that 2,984,370 short tons of 50-degree Baumé will be required for the manufacture of superphosphate in 1942—an increase of 433,370 tons over 1941. The fertilizer industry as a whole is not quite self-supporting so far as acid capacity is concerned. Especially in the Southeast and in the Midwest there is likely to be a shortage of acid within the industry, since the industry in those sections is largely dependent upon purchased acid. Following the declaration of war there will be, of course, a rapid increase in the number of explosives plants, which, with other defense needs, means a further rapid increase in the demand for acid.

Exclusive of new plants planned by the Government, at least 9 new acid plants, representing perhaps 200,000 tons of 100 per cent

added capacity, are in various stages of projection or completion, but they can scarcely affect the spring season of 1942. Three unused chamber plants that could be rehabilitated and put into operation would produce from 50,000 to 60,000 tons of 50-degree acid.

Recommendations

After full discussion, the group:

(1) Endorsed the building of new acid plants and governmental efforts to encourage the rehabilitation of old plants.

(2) Recommended that all affected groups, because of limited storage space in superphosphate plants, take steps to move superphosphate promptly, through normal channels, from acidulating plants to farmers.

(3) Recommended that fertilizer manufacturers engaged in sulphuric acid production be encouraged to fill, first, orders from manufacturers of superphosphate before making additional commitments to other industries.

(4) Recommended that the War Department be requested to give consideration to favorable priorities for new acid plants to be installed by members of the fertilizer industry.

(5) Recommended that the fertilizer industry join the Government in emphasizing the greater need for crops that produce protective foods, which crops for the most part require greater use of superphosphate.

Price Levels of Sulphuric Acid

Representatives of OPA pointed out that OPA is functioning to prevent inflation by preventing the taking of undue or unwarranted margins. Sulphuric acid for fertilizer has always been sold on a lower price level than when sold to other industries. The fertilizer industry is a large consumer, and because of the nature of the product it manufactures, can absorb acids that some other industries cannot use. OPA has no indication that the customary practices of the fertilizer industry with respect to the purchase of acid are to be changed materially. There is no inclination on the part of producers it has contact with to take advantage of the situation and disturb the traditional position. The OPA is alert, keeping in constant touch with producers and consumers, and such steps as may be necessary from time to time will be taken to insure that the price of sulphuric acid does not exceed reasonable bounds.

Price Levels of Superphosphate

OPA is assuming that superphosphate will be priced reasonably to farmers in the spring

of 1942. If price behavior should not support this assumption, it will then take steps to consult that portion of the industry that seems to be too high-priced and endeavor to work out an adjustment.

OPA is reluctant to see a ceiling put on the price of superphosphate to farmers or to dealers. It does not believe that the industry desires prices so high that they will have to be pulled down. Furthermore, a price ceiling, should one become necessary, would, even after extreme refinements, result inevitably in some inequalities in some areas.

Nitrate of Soda

A report was made on nitrate of soda. OPM, by cooperation with the two nitrate sales agencies, has substantially withdrawn nitrate of soda from sale for ordinary industrial and agricultural purposes. No nitrate is moving anywhere to anybody without the consent of OPM. The chances are that a considerably smaller amount of nitrate will be available for fertilizer purposes than was expected before December 7, when Japan began its war upon us. It is expected that there will be an official order about the first of the year. Whatever amount is available for fertilizer will be distributed, with the full cooperation of the nitrate companies, with the greatest possible degree of justice and equity; and as rapidly as the situation changes, the amounts being allowed to move will be increased. The distribution will bear a relationship to use in previous years. Allocations will be handled from month to month. If, contrary to previous and then well-founded expectations, we do not get any more nitrate in from now on, there is a fair chance that the fertilizer industry will get very little. OPM hopes that members of the fertilizer industry will have enough discretion to use their share of nitrate of soda to the best advantage of their customers, who in turn should use it to the best advantage of their farmer customers.

In view of the shortage of nitrate of soda and high nitrate prices during the first World War, OPA contemplates a price structure somewhat as follows:

(1) The port or point of production price would be a matter of negotiation between OPA and the nitrate companies. To this price would be added transportation charges to the interior and the usual cost of tax tags.

(2) To the fertilizer mixers' cost as thus ascertained would be added not more than \$2.00 a ton gross margin, whether the nitrate is

(Continued on page 18)

What Has a Salesman the Right to Expect From His Sales Manager?*

By HARRY SIMMONS

MOST salesmen want a leader rather than a driver . . . a boss who can sell himself and can furnish helpful counsel . . . a chief who is fair and sympathetic and resourceful.

Here are the results of a recent sales meeting attended by over 200 salesmen. The men, who were in from the field for the meeting, were given the opportunity to write their answers, anonymously, to the question that is the title of this article. Thus they were able to unburden themselves without fear or favor.

It is interesting to see how practical and pointed their replies were. Also how constructive. For sales managers who have turnover troubles with their men—or those who cannot understand why their salesmen are frequently afflicted with laziness, or temperament, or stupidity, or disloyalty, these bonafide replies might be illuminating.

Let's see if there is anything to be learned from the verbatim expressions of these hard-working salesmen direct from the field:

1. *"The sales manager should have the interest of the salesmen at heart."*

Sounds trite. But isn't it a fact that some sales managers play up to their executives rather than to their salesmen? How quickly salesmen recognize this condition, and how certainly do they show their resentment by their failure to cooperate. A manager who cannot keep his salesmen assured that he is

working for their best interests can hardly be called a "leader of men." Or can he?

2. *"Should be willing to work as hard as any of the salesmen."*

How often do sales managers pass the buck to their men in the field and let them shoulder the entire load? Managers who have risen from the ranks know what it means to a salesman to work with him side by side, figuratively and literally, in a brotherhood of perspiration.

3. *"Should have a personal knowledge of firing line conditions."*

Such knowledge can come only from personal contacts out in the field. Which reminds us again that both salesmen and customers are built up out in the territory rather than behind impressive flat top desks. How much time do sales managers spend in the field?

4. *"Should be a leader who can personally demonstrate how to sell."*

Academic sales training lectures promulgated through "pep letters" and house bulletins may be well enough in their way—but they don't weigh enough. Constructive sales training must include occasional "how to sell" calls made with the salesmen on actual prospects or customers.

5. *"Must be absolutely honest and a man of his word."*

This quality is self-evident; but many a manager, influenced by temporary enthusiasm or a desire to smooth over a salesman's

* Reprinted from Sales Management.

(Continued on page 24)

BRADLEY & BAKER

FERTILIZER MATERIALS - FEEDSTUFFS

AGENTS - IMPORTERS - BROKERS

155 E. 44th Street
NEW YORK

Clinton St. & Danville Ave.
Baltimore, Md.

BRANCHES
505 Royster Building
Norfolk, Va.

1252 West Beaver Street
Jacksonville, Fla.

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

FERTILIZER MATERIALS MARKET

NEW YORK

No Change in Year-end Market. Deliveries of Some Materials Slow but Fairly Satisfactory. Burlap Situation Serious.

Exclusive Correspondence to "The American Fertilizer."

NEW YORK, December 30, 1941.

With the close of the year, there is practically no change in the materials market.

Nitrate of Soda

No deliveries are being made as yet against contracts for nitrate of soda.

Sulphate of Ammonia

Sulphate of ammonia and potash are being delivered against contracts. In most cases, shippers are somewhat behind schedule but, as a whole, deliveries are fairly satisfactory.

Burlap Bags

One of the new difficulties now faced by the fertilizer industry is the question of bags to pack mixed fertilizers. Whereas in previous years approximately eighty per cent of the burlap was used by the fertilizer and kindred industries, approximately two-thirds of expected imports will be requisitioned by the Government so that even if all expected imports arrive, a tremendous scarcity will be felt.

Organics

Organics are in fairly good demand. Deliveries are being made against contracts but higher prices prevail for additional business.

Fish Scrap

Fish meal demand continues with prices firm.

Superphosphate

Superphosphate continues in good demand with material scarce. With the tremendous demand for sulphuric acid, it is probable that it will only be with government intervention that the superphosphate production will be increased further.

BALTIMORE

No Outstanding Features in the Market. Manufacturers Accumulating Stocks for Spring Mixing. Burlap Restrictions Announced.

Exclusive Correspondence to "The American Fertilizer."

BALTIMORE, December 30 1941.

There have not been any outstanding features in connection with the market on fertilizer materials during the past two weeks, due to the holiday season, but the market continues steady without any material changes.

Ammoniates.—There is very little buying going on at the present time, and the market on feeding tankage continues nominally \$5.70 per unit of nitrogen and 10 cents per unit of B.P.L., f.o.b. basis Baltimore. Blood is also being held on the same basis, and the present price of these commodities really takes them out of the class of fertilizer materials.

Nitrogenous Material.—The market on this article is unchanged at nominal quotation of \$3.70 per unit of nitrogen, f.o.b. Baltimore.

Sulphate of Ammonia.—Practically all manufacturers are accumulating stocks to carry them through the spring season, and in the meantime there is practically no interest being shown or offerings being made of re-sale material.

Nitrate of Soda.—While importers of the Chilean product have extended prices to January 31, 1942, they are still not making any deliveries, and recent governmental suspension is still in effect, although it is reported that deliveries for fertilizer purposes will probably have to be approved by OPM before shipment is made. The nominal price, in bulk, is \$30.00; in 200-lb. bags, \$32.40; and in 100-lb. bags, \$33.00, all per ton of 2,000 lb., f.o.b. port warehouses.

Fish Meal.—The market on this product continues unchanged at \$69.00 to \$70.00 per ton in 100-lb. bags, f.o.b. Baltimore, guaranteed 60 per cent protein.

Southern Agriculturist

For Worn-Out Corn Land

H. A. Scott of Merrill Dairy Farm in Piedmont, North Carolina, started with 15-bushel corn land in 1922 and now is not surprised to make 80 bushels per acre. A dairy herd that consumes most of the feed produced on the farm and some purchased concentrates has been a big factor in building up the fertility of the land, but fertilizer and legumes have had their part too.

He uses a complete fertilizer for his corn and his small grain. The small grain gets 35 to 50 pounds of muriate of potash, 200 pounds of pounds of nitrate of soda per acre in the fall and then a top dressing of 100 pounds each of 30 per cent superphosphate and nitrate of soda in late March. Eight pounds of red clover and 15 pounds of Korean lespedeza per acre are seeded on the small grain at about the time the top dressing is given in the spring. He marks the land with a disc and a seed clover and lespedeza with a seed drill. This crop produces wheat, sometimes pasture and some-

What Would Hitler Give For An Army Like This?



Food for Freedom... the Secret of 1942

Cows to give 123,000,000,000 lbs. of milk; hens to lay 40,000,000,000 eggs; 75,000,000 hogs to give up their lives; 750,000,000 chickens for poultry man... and so on. These are food production goals already set for 1942.

WHAT would Hitler give for this army?

The best answer to that question is... what wouldn't he give? This army of cows, hogs and chickens, not to mention other livestock and food crops—which no nation but ours can raise—is the army that will win the war; the army that will dictate terms; the army that will establish a world order in which free men can live in peace with their fellows and find favor in their Creator's eyes.

This army is being mobilized now on our farms... mobilized for greater food production in '42 than in any previous year. The future of the whole civilized world is bound up with our effort to produce all the vital foods, rich in nutritional value, which our own huge defense program demands, and which heroic Britain requires.

The job we have undertaken is tremendous. It involves sharp

increases in livestock, poultry, eggs and dairy products.

Your nation asks you to roll up your sleeves and produce as you never have before. Farmers are the only Americans who can do this one job which is the absolute rock bottom of national defense.

Your farm is a munitions plant. Food is as vital as guns, bombs, ships, tanks or planes. Foods from your farm will build our own strength and morale. These self-same foods are the very core of Britain's defense.

the stamina and spirit of her people. It is up to us in 1942 to furnish one-fourth of all the animal protein food that Britain needs—enough to feed 10,000,000 people.

Food is the biggest gun in the whole war... and we can produce more food and better food of the needed kinds than any other nation in the world. "Food for Freedom."



YOUR FARM CAN HELP

This is one of a series of reports from the United States Department of Agriculture published by the Children's National Educational Bureau, Inc., in furtherance of the Nation's educational defense program. Publication of this report in this space does not constitute endorsement by the United States Department of Agriculture of any commercial product.

"FOOD FOR FREEDOM"

THE Food for Freedom program organized by the United States Department of Agriculture is so vital to America's own war needs and the policy of all aid to the democracies, that we are devoting our farm paper and radio advertising to furthering the Department's drive.

NATURAL CHILEAN NITRATE OF SODA

NOTE: This advertisement appeared in farm papers in December.

by connections and... and are shipped by the express to Dallas and Fort Worth, Texas, Oklahoma City and Tulsa, Oklahoma, Kansas City and St. Louis, Missouri—W/H Rice.

ONE BOX SAYS NEW ST. JOE, ARIZONA

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

Superphosphate.—It is reported that some producers are now quoting 60 cents per unit for run-of-pile, and \$10.10 per ton for flat 16 per cent grade, both in bulk, f.o.b. Baltimore. This represents an advance of approximately only 10 cents per ton, and it is anticipated that there will be a good demand for superphosphate next year. It would not be surprising to see a shortage develop when the heavy consuming demand makes itself felt.

Bone Meal.—Steamed bone meal guaranteed 3 and 50 per cent is still nominally \$37.00 to \$38.00 per ton, while raw bone meal guaranteed 4½ and 47 per cent is unchanged at \$37.50 to \$38.00 per ton of 2,000 lb., f.o.b. Baltimore.

Potash.—While domestic manufacturers are still making deliveries against contracts previously booked, the fertilizer trade is accumulating stocks and there is practically no resale material offering on the market. Prices are firm, and it is anticipated that domestic producers will be able to supply the normal requirements of American fertilizer manufacturers.

Bags.—On account of the war situation the Government has issued regulations applying to heavy-weight burlap of 10 oz. construction and over, and all holders of spot and to-arrive burlap are to surrender two-thirds to the Government and the other third is restricted for agricultural and chemical use. Until the various features in connection with burlap regulations are interpreted, bag manufacturers are marking time and all contracts are temporarily in suspension. Other industries who in the past used as much as 20 to 25 per cent of the yearly imports of burlap will not be able to secure any supplies at all, and it is problematical as to just what quantities will be available to the fertilizer manufacturers. There have not been any regulations issued concerning cotton bags, but it would not be surprising if at some future date there will be a rationing of these along similar lines as burlap bags.

CHICAGO

Holiday Market Quiet with both Buyers and Sellers Awaiting Developments. Feed Market Stronger.

Exclusive Correspondence to "The American Fertilizer."

CHICAGO, December 29, 1941.

The holiday atmosphere prevails in this market, with both buyers' and sellers' positions unchanged and both marking time. Nothing in the way of new developments, therefore, can be noted. This situation, it is hoped, will change with the coming of the New Year.

An additional upturn in the list price of digester tankage has resulted in a stronger feed materials market.

Nominal prices are as follows: High grade ground fertilizer tankage, \$3.50 to \$3.75 (\$4.25½ to \$4.56 per unit N) and 10 cents; standard grades crushed feeding tankage, \$5.25 to \$5.35 (6.38 to \$6.50½ per unit N) and 10 cents; blood, \$5.00 to \$5.10 (\$6.08 to \$6.20 per unit N); dry rendered tankage, \$1.15 to \$1.20 per unit of protein, Chicago basis.

CHARLESTON

Better Demand for Fertilizer Organics. Prices Firm and Tending to Increase. Some Materials Scarce.

Exclusive Correspondence to "The American Fertilizer."

CHARLESTON, December 30, 1941.

Nitrogenous.—Interest in this material is quite strong and sellers' prices are firm and tending to increase. The market is around \$3.15 to \$3.30 per unit of ammonia (\$3.83 to \$4.01 per unit N) for immediate and January shipment. Some sellers are not offering past January. Prices are about 25 cents per unit of ammonia higher for shipment during March and April.

Blood.—This material is around \$4.60 to \$4.75 per unit ammonia (\$5.59 to \$5.77½ per unit N) at the ports for imported bagged ma-

Manufacturers' Sales Agents for **DOMESTIC**
Sulphate of Ammonia
 Ammonia Liquor :: Anhydrous Ammonia

HYDROCARBON PRODUCTS CO., INC.
 500 Fifth Avenue, New York

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

terial. Chicago market, \$5.00 (\$6.08 per unit N) and higher. Interest is strong, as prospects of freight difficulties on imported blood seem certain.

Fish Meal.—Offers continue scarce; price is around \$70.00 per ton, f.o.b. Norfolk.

Cottonseed Meal.—Price of 8 per cent grade is \$43.00 per ton at Augusta, and Columbia, S. C.; \$39.00 to \$39.50 at Memphis. The 7 per cent grade is quoted at \$40.00 at Augusta.

Superphosphate.—This situation is very tight; practically no offerings are available in this market.

Bone Meal.—Very little is being offered, especially the imported material. Price on 4½ and 50 per cent grade is around \$40.00, c.i.f. ports.

PHILADELPHIA

Market Quiet but Prices Continue Unchanged. Some Materials in Short Supply.

Exclusive Correspondence to "The American Fertilizer."

PHILADELPHIA, December 31, 1941.

The trade remains quiet. There has been practically no inquiry, but prices remain unchanged.

Sulphate of Ammonia and Nitrate of Soda are practically unobtainable at first hands.

Blood and Tankage.—A few offerings of blood are held at \$4.75 (\$5.77½ per unit N) and tankage, underground, at \$5.00 (\$6.08 per unit N) and 10 cents at shipping points.

Bone Meals are scarce and held at high figures.

Low Grade Ammoniates are in light demand but supplies are low and odd lots are held at high figures.

Superphosphate and Potash Salts.—No change since last report.

Allocation of Burlap Ordered by O. P. M.

Allocation of our entire burlap supply was ordered on December 22, 1941, by the Office of Production Management.

All of our burlap comes from India. Three-fourths of it is now used to bag agricultural and chemical products. The remaining one-fourth is used by the furniture, upholstery, rug and carpet, textile, meat-packing, and rubber industries.

Under the order, agriculture and chemicals (including fertilizers) will continue to receive burlap but in greatly reduced quantities. The other peace-time uses will be cut off entirely.

Much of the burlap will be used for defense purposes—for sand bags as protection against bombings and for camouflage.

The order applies to burlap now in this country in inventory and to future deliveries, with the exception of broken bales on which there is no restriction.

Unbroken bales now in inventory may be used for bags for agricultural and chemical products. None of it may be used for the other peace-time uses.

Burlap now en route to this country as well as future deliveries will be dealt with differently and more drastically. Two-thirds of it will be set aside in a stock-pile over which OPM will have control. Army, Navy and civilian defense will have first call on it. If any is left, it may be made available for bags for agricultural and chemical products and for hardship cases.

The remaining one-third will be used for the manufacture of bags for agricultural and chemical products.

The order sets up a system of quotas for importers, importing bag manufacturers, and non-importing bag manufacturers.

The quotas for importers apply to burlap

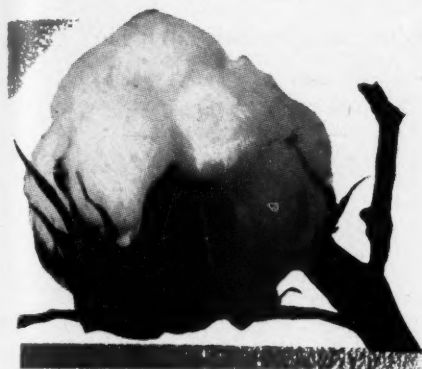
BACK TO THE LAND

Extracted from deposits beneath the Gulf Coast
at Port Sulphur, La., and Freeport, Tex., sulphur
—better than 99½% pure—goes back to the
land in fertilizer to help solve soil problems.

FREEPORT SULPHUR COMPANY

122 East 42nd Street, New York City

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.



WE'RE DOING OUR BEST... TO HELP AGRICULTURE DO ITS BEST

Fruitful harvests? They're a "must" today as never before! Ample food supplies are the very basis of the nation's effort. And to help soils throughout the country do their best job, American agriculture is making the heaviest demands upon the domestic potash industry in its history. As an important factor in this industry, we recognize our responsibility to see that agriculture shall not want for quality potash. Today management, personnel and equipment of the United States Potash Company are working together as a close-knit unit to assure adequate supplies of this major plant food in the days ahead.

UNITED STATES POTASH COMPANY

Incorporated
30 Rockefeller Plaza, New York

REG. U. S. PAT. OFF.



HIGRADE MURIATE OF POTASH
62/63% K_2O
Also 50% K_2O Grade
MANURE SALTS
22% K_2O Minimum

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

shipped from Calcutta on and after January 15th, and are based on their average annual imports during the period from 1935 to 1939 inclusive.

Quotas for non-importing bag manufacturers become effective January 1, 1942, and are based on their burlap purchases in 1939 and 1940.

Bag manufacturers are required to distribute bags to their 1941 customers in the same proportion as they did in 1941.

Slashing or mutilating bags in opening them is prohibited.

Inventory of any importer, importing bag manufacturer, or non-importing bag manufacturer is restricted to a 30 days supply.

It would seem that under the terms of the order, sufficient burlap for fertilizer bags will not be available. However, the pressing need for bags by this industry in the immediate future has been presented and is receiving consideration in connection with the operation of the order.

FERTILIZER DEFENSE COMMITTEE DISCUSSES MATERIAL REQUIREMENTS

(Continued from page 11)

shipped in straight cars from port to destination or put through either a port fertilizer plant or an interior fertilizer plant. However, when it is put through an interior fertilizer plant, there may be added to the price of the farmer or the dealer, not more than the actual cost of transportation from the inland factory or inland warehouse to the point of use. The margin of the dealer or agent, regardless of the method by which he receives the nitrate, would be held to a gross of not more than \$2.00 a ton above the cost to him delivered at the farm.

Summing up, to the cost of nitrate at port or point of production, plus the transportation charged to points of use and tax tag costs,

there would be added not more than \$4.00 a ton total, \$2.00 for the mixer, who is the buyer, and \$2.00 for the dealer or agent. Customary charges on credit sales would be permitted.

LEADING FERTILIZER GRADES IN MAINE

A survey made by Dr. J. A. Chucka shows that in Maine during the 1940 fertilizer year, a total of 69 grades of fertilizer grades were sold. Of the tonnage of mixed fertilizers, 75 per cent were represented by six grades: 8-16-20, 5-8-12, 5-8-10, 8-16-6, 8-16-14 and 4-8-10. It is to be noted that the plant food in these most popular grades ranged from 22 to 44 per cent. The survey covered the sales of 21 companies and included about 90 per cent of the total tonnage sold in the state.

CLASSIFIED ADVERTISEMENTS

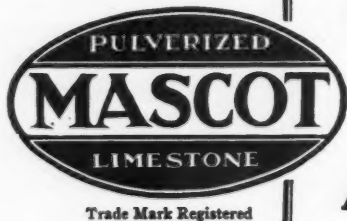
Advertisements for sale of plants, machinery, etc., and for help and employment, in this column, same type as now used, 60 cents per line, each insertion.

FOR SALE

FOR SALE—FERTILIZER PLANT. Stedman Dry Mixing Plant complete with Bag Printing Press. Capable of turning out as much as 10,000 tons of mixed goods per season. Address, VICTOR COTTON OIL COMPANY, GAFFNEY, S. C.

HELP WANTED

WANTED man with eight or ten years' experience in the manufacture of superphosphate and complete fertilizers to act as Assistant Superintendent of plant in middle west. Must have High School education or better and must be able to furnish best of references. Excellent opportunity for promotion. In applying please state age and salary expected. Address "510," care THE AMERICAN FERTILIZER, Philadelphia.



MAGNESIUM LIMESTONE

"It's a Dolomite"

American Limestone Company
Knoxville, Tenn.

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.



FOR FIGHTING AND FOOD

International Produces Basic Materials That Will Help Win the War

International is building plants at Austin, Texas, and Carlsbad, New Mexico, for the Defense Plant Corporation and, with the aid and cooperation of Dow Chemical Company, will manufacture vitally needed magnesium metal.

International is also supplying industry and agriculture with vital materials from mines and plants at more than 30 strategic points.

PHOSPHATE—our Florida and Tennessee phosphate mines are producing at capacity to supply the demand from domestic fertilizer manufacturers.

POTASH—with *International's* additional production of a complete line of all grades of potash at the Union Potash Mines at Carlsbad, New Mexico, America is now completely independent of foreign supplies of potash.

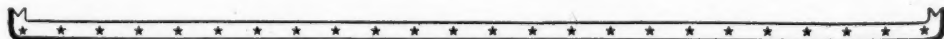
FERTILIZER—larger tonnages of "International Fertilizers" are being manufactured to help farmers produce with less labor the huge crops which will be needed by the country and the world in 1942.

CHEMICALS—phosphoric acids and associated chemicals are being supplied by *International* for use in many essential war materials.

Today with rapid expansion in its activities, with new manufacturing plants being built and planned, with a larger research staff working on product improvement and development for all divisions of the corporation and with a steadily growing organization, *International* is well prepared to meet its present and future responsibilities to agriculture, industry and America.

On December 1, 1941, *International Agricultural Corporation* changed its name to—

INTERNATIONAL MINERALS & CHEMICAL CORPORATION
20 N. WACKER DRIVE, CHICAGO, ILLINOIS



MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

FERTILIZER INDUSTRY ADJUSTMENTS DURING THE EMERGENCY

(Continued from page 7)

somewhere, on the part of some fertilizer companies with large investments, including companies serving only regional territories, to be led astray by the wishful sales thinking of their speculative elements into making new sales commitments in expanded territory beyond their foreknown and certain ability to deliver the goods. The Office of Price Administration is aware of this temptation, and wishes it known in advance that the use of the familiar, old, buck-pushing alibi that the Government allocated or diverted materials from the fertilizer industry beyond expectations will be regarded in the same category as any other commercial subterfuge.

Fertilizer mixers are essentially converters of raw materials into complete goods ready for application to the soil. A large part of the fertilizer industry actually produces no materials of any kind. The only true ready-to-use material produced by some mixed fertilizer companies is superphosphate, which, on the whole, has been and is reasonably priced.

As converters of other people's commodities and merchandisers of complete fertilizer, the mixed goods industry has been accustomed over a long period of years to operate on a close, and at times non-existent, margin of profit. The whole economy of the mixed fertilizer industry, including a scaling down of sales costs in general, has been geared to render maximum service at moderate cost.

As the industry turns now toward 1942, with materials at moderate prices, either in hand or flowing, a sudden hallucination that a great profit opportunity has arrived would be decidedly out-of-focus. Unusual profits are not made, generally, in a market adequately supplied with materials. This has been the case in the fertilizer industry, but today supplies barely are sufficient for 1942 needs. To seize upon this tightened, new situation to raise prices of mixed goods to levels inconsistent with the costs of raw materials would be both a reflection on the contributions made nationally by the suppliers of raw materials on the one hand

and an admission on the other hand that the farmers' situation is not truly understood by the fertilizer industry.

Farm incomes per farm operator are still low. The farmers' buying power continues to be limited, with comparatively few exceptions. Potato growers, for example, are not prosperous; and they are very large users of fertilizer. Dairymen, the chief users of superphosphate as such, are yet to reflect any real degree of prosperity. The price index on milk in New York State in August was 120, but, translated in terms of increased farm labor costs in the same area, it was only 93. Since then, too, the dairyman has been hit hard by a phenomenal rise in the cost of feedstuffs. Production of some other staples, while at profitable levels per unit of production, nevertheless are limited in respect to gross profits by acreage production controls. Typical examples are wheat, cotton, and tobacco.

More concern is being given by Government on prices of materials than upon prices of complete fertilizer. The movement of mixed fertilizer from factory to farm has been much more highly competitive than the movement of nitrogen materials, superphosphate, and potash to the fertilizer factory. The scramble for farmers' business however is generally severe, and for many years competition has been the best determinator of mixed-goods prices. With materials not in liberal, but in adequate, supply for the mixers, I have not doubt that the accustomed situation will again prevail (to a large extent).

While the price situation on mixed fertilizer certainly will be watched, I have faith, as a former member of the fertilizer industry that the attitude of the industry in respect to mixed fertilizer prices to dealers and agents will be such that a minimum of attention will be required by the Office of Price Administration.

The greater part of the nation's complete fertilizer is moved through manufacturers' local agents, who are required to sell at retail prices not higher than those fixed by the manufacturer. With this majority of the industry, therefore, control of retail margins will be comparatively simple and easy. However, a minor

| | | | | | |
|---|---|---|--|--|---|
|  | FERTILIZER PLANT EQUIPMENT | | | | |
| | Dependable for Fifty Years | All-Steel Self-Contained Fertilizer Mixing Units | Batch Mixers— Dry Batching Pan Mixers— Wet Mixing | Swing Hammer and Cage Type Tallings Pulverizers | Vibrating Screens Dust Weigh Hoppers Acid Weigh Scales |
| Founded 1834 | STEDMAN'S FOUNDRY & MACHINE WORKS 505 Indiana Ave. AURORA, INDIANA, U.S.A. | | | | |

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

The Most Popular New Material on the Market

SUL-PO-MAG

America's Own
SULPHATE of POTASH-MAGNESIA

SUL-PO-MAG is a business builder you can use with confidence. Farmers have known and used Sulphate of Potash-Magnesia for many years. When you tell them that your fertilizer contains a new and better All-American form of this familiar product, you are building tonnage that is not dependent upon the uncertainty of foreign imports.

Fertilizer manufacturers have been quick to recognize the advantages of using **SUL-PO-MAG** to establish sales leadership for premium mixtures. There is a big demand for **SUL-PO-MAG** in the trade today. Its high Potash and Magnesia content...its low price...its excellent mechanical condition...its solubility...its easy-mixing qualities...and its crop-producing power—all combine to make it the most popular new material on the market.

It will pay you to get all the information on **SUL-PO-MAG** before figuring your requirements for the season just ahead. Ask the Union Potash representative who calls on you...or, communicate with our nearest office.

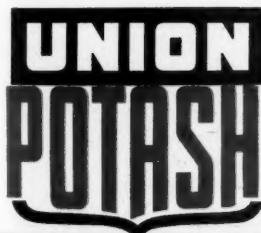
SUL-PO-MAG is the new, high-grade, American Sulphate of Potash-Magnesia, produced from rich, double-sulphate langbeinite ores mined at Carlsbad, New Mexico.

SUL-PO-MAG, with a minimum of 40% K_2SO_4 , contains 21.62% K_2O and 18.50% minimum Magnesium Oxide—all water soluble and completely available to plants.

SUL-PO-MAG is offered at an attractive, low price, comparing favorably with the going price of water-soluble Magnesium plus the price of K_2O in other grades of Potash.

SUL-PO-MAG is an excellent mixer. Its granular form and superior mechanical condition—with dry, well-formed crystals—make it much less subject to caking. Some fertilizer manufacturers use it directly in their mixture instead of in the base goods.

SUL-PO-MAG is neutral in reaction and the Potash and Magnesia remain entirely water soluble when incorporated in fertilizer mixtures. Any quantity may be used in mixtures without causing reversion of P_2O_5 or loss of Ammonia.



UNION POTASH & CHEMICAL COMPANY, Inc.

20 North Wacker Drive, Chicago, Ill.

61 Broadway, New York, N.Y. • Volunteer Building, Atlanta, Ga.

...the only All-American company now producing a complete line of Potash Salts: Muriate of Potash 60% K_2O , Muriate of Potash 50% K_2O , Granular Muriate of Potash 50% K_2O , Manure Salts 30% K_2O , Sulphate of Potash 90/95% K_2SO_4 , and **SUL-PO-MAG**—America's Own Sulphate of Potash-Magnesia—minimum 40% K_2SO_4 18.50% MgO .

but sizeable portion of manufacturers sell through dealers who fix their own margins.

To mixers selling through dealers, let me say that they have the same obligation as those who operate the agency system—to see to it that dealers' margins are kept at the same conservative, equitable levels which I am sure most men in the industry desire to prevail.

The Office of Price Administration desires to cooperate constructively with all factors of the fertilizer industry, including producers of nitrogen, superphosphate, and potash, as well as with mixers and marketers of complete fertilizer. No disposition has been shown by Mr. Henderson and others in the OPA to insist upon ignoring fundamental changes in costs. We will continue to strive to see that any legitimate industry needs will be recognized and dealt with fairly as cost factors change.

May I say in conclusion that I have been a "G"-man for only a few short months, and that in a few more short months, when my temporary employment ceases, I desire to go back home with some modicum of respect from Government, from farmers, and from the fertilizer industry.

International Develops Expansion Program

From its mines and plants at more than 30 strategic points throughout the country, International Minerals & Chemical Corporation is supplying to industry and agriculture basic materials which are essential both for feeding the nation and for war materials.

International's President, Louis Ware, who recently announced that his company has contracted to build and operate magnesium metal plants for the Defense Plant Corporation, now reports that construction of the new plants at Carlsbad, New Mexico, and Austin, Texas, is proceeding satisfactorily. The Austin Company of Cleveland was selected by International to design and construct the new plants.

For more than two years, International has been conducting research in the processing of magnesium materials. Upon completion of its plants and with the technical cooperation of Dow Chemical Company engineers, International will manufacture magnesium metal from magnesium chloride produced at its Carlsbad Union Potash mines and from other available magnesium ores.

Thirty-two-year-old International Minerals & Chemical Corporation, formerly International Agricultural Corporation, enters the new

year with both a new name and new Chicago general offices. According to Mr. Ware, the consolidation in Chicago of its New York executive offices and its Atlanta operating offices centralized for the first time in the company's history all its executive, administrative, manufacturing, research, and sales divisions in one office with resultant greater efficiency and economy in its operation.

The world's largest producers of phosphate rock, International is operating at capacity at its Florida and Tennessee phosphate mines to supply the present increased demand for domestic fertilizer manufacturers. At its own fertilizer plants located in many cities in the south, east and central west, International is manufacturing larger tonnages of fertilizers than ever before to help farmers produce more food per acre and with less labor in order to supply the large crops which will be needed by the country and the world in 1942.

International has under construction a new phosphate rock and flotation plant at Pembroke, Florida. This new plant, which is expected to be in operation in May, will have the largest production capacity in the history of the company.

With International's additional production of a complete line of all grades of potash at the Union Potash Mines at Carlsbad, New Mexico, America is now completely independent of foreign supplies of potash.

SOUTHERN PHOSPHATE TO MOVE OFFICES

The offices of the Southern Phosphate Corporation are being moved from Baltimore to New York. The Baltimore office will be closed on January 8th and the new offices opened in New York on January 12th at 342 Madison Avenue, corner of 43rd Street.

**We Are Ready to Do
Our Part.**

How May We Help YOU?

THE DICKERSON COMPANY
Incorporated
Drexel Building, Philadelphia, Pa.
— Brokers —
FERTILIZER MATERIALS

FERTILIZER MATERIALS

LET US QUOTE
YOU ON YOUR
REQUIREMENTS
OF THESE
MATERIALS

+
PHOSPHATE ROCK
+
SUPERPHOSPHATE
+
DOUBLE
SUPERPHOSPHATE
+
NITRATE of SODA
+
SULPHURIC ACID
+
SULPHATE of
AMMONIA
+
BONE MEALS
+
POTASH SALTS
+
DRIED BLOOD
+
TANKAGES
+
COTTONSEED MEAL
+
BONE BLACK
+
PIGMENT BLACK
+
SODIUM
FLUOSILICATE



ARMOUR FERTILIZER WORKS

General Offices: Walton Building, Atlanta, Ga.

Division Sales Offices:

| | | |
|-----------------------|----------------------|-------------------|
| Albany, Ga. | Columbus, Ga. | New Orleans, La. |
| Atlanta, Ga. | East St. Louis, Ill. | New York, N. Y. |
| Augusta, Ga. | Greensboro, N. C. | Norfolk, Va. |
| Baltimore, Md. | Havana, Cuba | Presque Isle, Me. |
| Birmingham, Ala. | Houston, Texas | San Juan, P. R. |
| Chicago Heights, Ill. | Jacksonville, Fla. | Sandusky, Ohio |
| Cincinnati, Ohio | Montgomery, Ala. | Wilmington, N. C. |
| Columbia, S. C. | Nashville, Tenn. | |

WHAT HAS A SALESMAN A RIGHT TO EXPECT FROM HIS SALES MANAGER?

(Continued from page 12)

temporary mental condition, makes wild-eyed promises that he hasn't the slightest intention of keeping or that he forgets 30 minutes later. He also seems to forget that the salesman will remember.

6. *"Should be a man who knows more than I do."*

Obviously, a sales manager is in that class; and he demonstrates his superior wisdom by the tactful handling of his men and by careful transmission of his knowledge. So doing, he instills confidence and respect for his knowledge and ability. Unless he can instill that confidence he has a tough job ahead of him.

7. *"Should be a man who is resourceful and can see a long way ahead."*

It is the manager's duty at headquarters to pass on the results of his broader perspective, in such a way that the man in the field can understand why he is asked to do a pioneering job and how to go about building up a customer on a slow-but-sure basis. Many a salesman's discouragement stems from a lack of understanding of his orders. He is unable to visualize the pot of gold at the end of the rainbow. This is the vision the sales manager supplies, in order to activate the golden reservoir of ambition that lies within each human.

8. *"My sales manager should live a clean life."*

It goes without saying that a sales manager's moral character makes an immediate impression upon his salesmen. Entertainment nights of wine, women and song develop no inspiring responses in the minds of men who earn their daily bread by the sweat of their sales ability, and who are expected to present a strong character front to their prospects and customers.

9. *"Should be a man who gives credit where credit is due, and not merely criticism."*

In other words, constructive criticism tempered with justice and mercy and understanding—plus an occasional pat on the back—covers a multitude of sins. It transforms a salesman's grouch into a battering ram of

enthusiasm. Any man can criticize—but not every man can criticize constructively. One tears down; the other builds up.

10. *"Should have a safe and sane middle-of-the-road balance."*

The human machine requires balance as much as a watch. To maintain discipline and to increase respect for his actions, a leader of men must have the kind of equilibrium that keeps him standing firm on two feet no matter what happens. He will not go off half-cocked and make a spectacle of himself; neither will he veer so far to the right that his men will feel he is a conservative old fogey.

11. *"Must be able to help me at all times with difficult accounts."*

Help may be given the salesmen in various ways: Through the mails, over the telephone, by means of the advertising, in bulletins or house magazines, through third party testimonials, or by personal contacts. In any event, the important thing is the concrete evidence of a desire to help. One move to help a salesman moves many a salesman to help himself.

12. *"Should supply me with as much information and sales aids as possible."*

It is a fact that too many sales managers expect their salesmen to acquire such new information through some mysterious hocus-pocus or mental telepathy. A manager will spend hours going over new plans and ideas with his advertising manager, where he wouldn't think of "wasting" a fourth as much time with a salesman. He often takes it for granted that his assistants are sending the necessary information and sales aids to the salesmen; and his assistants may do likewise.

As a result, the salesman is frequently left in the dark and is forced to plow his own furrow with a dull, worn-out piece of machinery.

13. *"Must be fair and back me up in all my problems."*

In the final analysis, headquarters support does consist largely of being "backed up" by the sales manager. His degree of loyalty to the salesmen definitely affects their loyalty to him. The salesman in the field likes to feel at all times that he can depend upon his sales

L.W. HUBER COMPANY
Brokers Fertilizer Materials
 — ROOM 903 —
 170 Broadway
 New York, N.Y.



ACID PLANTS

**COMPLETE FERTILIZER PLANTS
ACID CONCENTRATORS
AMMONIA OXIDATION UNITS**

CHEMICO Service includes complete processes, equipment and structures, training of working crew, and initial operating supervision.

CHEMICO performance guarantees are based on 27 years of specialized experience in acid production and recovery, and the results obtained in world-wide installations.

Your Inquiry is Invited

Chemical Construction Corporation
30 Rockefeller Plaza, New York, N.Y.

**CHEMICO PLANTS are
PROFITABLE INVESTMENTS**

Keyed SERVICE!

Fertilizer plants all over the country—large and small—state their needs and we meet them. Large stocks of seasoned materials and ample modern production facilities enable us to make prompt shipments.

TRIPLE SUPERPHOSPHATE

46 to 48% Available Phosphoric Acid

We also manufacture
HIGH-GRADE SUPERPHOSPHATE

U. S. Phosphoric Products

Division
TENNESSEE CORPORATION

Tampa, Florida

New York Office:
61 Broadway
Washington, D. C.
716 Investment Bldg.

Sales Agents:
Bradley & Baker
155 East 44th St.
New York, N. Y.

A Mark of



Reliability

SPECIFY THREE ELEPHANT



... WHEN BORON IS NEEDED TO CORRECT A DEFICIENCY OF THIS IMPORTANT SECONDARY ELEMENT

Agricultural authorities have shown that a lack of Boron in the soil can result in deficiency diseases which seriously impair the yield and quality of crops.

When Boron deficiencies are found, follow the recommendations of local County Agents or State Experiment Stations.

Information and references available on request.

AMERICAN POTASH & CHEMICAL CORPORATION

70 PINE STREET, NEW YORK CITY

Pioneer Producers of Muriate of Potash in America

See Page 4

manager to back him up in all his troubles with his customers, and with his home office. One is as important as the other. Above all, he likes to feel that his manager will be fair, even though he may be firm.

14. *"He should not humiliate me in front of other salesmen or customers."*

It is unthinkable that any sales manager would so ignore the natural human feelings of a salesman. Unfortunately, some managers have an idea that correcting a man in front of other salesmen makes a strong impression on all of them. He is quite right—but it is not the favorable impression he has in mind. When we shatter a salesman's pride and self-respect, we break down his morale—and that is fatal.

15. *"He should be sympathetic and a good judge of human nature."*

The handling of men is one of the most delicate tasks in the realm of business. We sales managers stand or fall by our ability to sympathize properly and to judge accurately all the varied bits of human machinery we direct. And by sympathy I don't mean sentimentality; nor by good judgment do I mean casual opinion.

16. *"He should be a good merchandiser so as to give me good 'deals' to sell."*

Which is only another way of saying that a sales manager had better know his business. If he doesn't, he is going to be found out sooner or later; so he had better study up on his job before it is too late. It is more difficult to recover respect that is once lost, than to stay out in front with it while you have it.

17. *"He should take good care of my compensation problems."*

Certainly it is a short-sighted sales manager who would attempt to take advantage of a salesman in a matter of compensation. The best rule to follow in any matter of sales compensation is this: Try to give a man more than he expects in compensation, and he will give you more than you expect in sales effort.

18. *"He should keep me in mind for chances of promotion."*

What advancement may the average salesman look forward to? He might get a more important territory, or a raise in salary, or be appointed a supervisor or a branch manager or assistant at the home office, or even sales manager. If we can keep the hope of promotion before a salesman, and prove our sincerity by advancing the men from the field, we provide a constant incentive to every man's ambition.

19. *"He should be accessible to me when I come to headquarters."*

This is but a fair request to make of any sales manager. How many of us are "too busy" to see a man when he comes in, and turn him over to some assistant? The satisfactory personal contact that a salesman has with his manager satisfies his ego, builds up his loyalty and enthusiasm, and sends him back into the territory with his fighting spirit recharged.

Here are a few of the more general replies that were included in this symposium:

"I expect him to be firm with me regarding my mistakes, but also to look for the reason—the extenuating circumstances; and never under any conditions to bawl me out in front of a customer or by letter direct to a customer."

"I expect my sales manager to keep me buoyed up with enthusiasm, not necessarily by "pep" talks or letters, but by his own actions and attitudes."

"I expect him to have a thorough knowledge of my territory and conditions, and I like to know when I am discussing sales matters with him that he is familiar with the accounts I mention" . . . "I would like my sales manager to be a good listener, so that he can straighten me out properly."

ALEX. M. McIVER & SON

Official Brokers for

MILORGANITE

Specializing

CHILEAN NITRATE OF SODA

Nitrogenous Materials

Blood and Fertilizer Tankage

Bone Meals

Manganese Sulphate

**SOUTH AMERICAN DRY
RENDERED TANKAGE**



**PEOPLES OFFICE BUILDING
Charleston, S. C.**

• **SOUTHERN PHOSPHATE CORPORATION** •

Miners of FLORIDA LAND PEBBLE

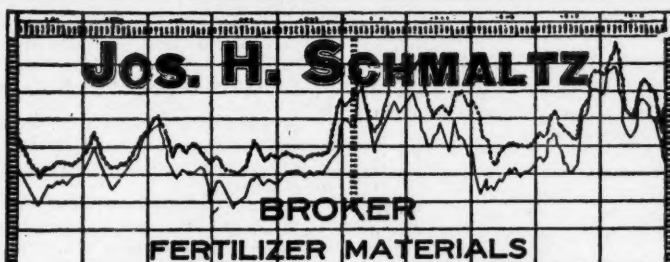
PHOSPHATE ROCK

~ all commercial grades!

Plants at Sangully, Pauway, Medulla and Ridgewood, Fla.

MAIN OFFICE • *Baltimore Trust Building* • BALTIMORE, MD.

Tankage
Blood
Bone
All
Ammoniates



327
South
La Salle
Street
CHICAGO

OFFICIAL BROKER FOR MILORGANITE

For over 20 years we have
served the Fertilizer Industry

ACID-PROOF CEMENT

Ready Mixed—For Immediate Use
Packed in 250-lb. Steel Drums
Dry-Packed in 100-lb. Bags

CHEMICAL PUTTY

Stops Acid, Gas and Water Leaks

QUARTZ PEBBLES

Graded to Size

FILTER GRAVEL, FILTER SAND

ACID VALVES

SOUTHERN DISTRIBUTORS OF
CALGON (Sodium Hexametaphosphate)

ACID BRICK, SPIRAL RINGS

Charlotte Chemical Laboratories

INCORPORATED
Laboratories, Plant, Office
CHARLOTTE, N. C.



Specializing in

Sulphate of Ammonia
Low Grade Ammoniates
Superphosphate
Sulphuric Acid
Bags

*Inquiries and offerings
invited*

KEYSER BUILDING

BUYERS' GUIDE

A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"



This list contains representative concerns in the Commercial Fertilizer Industry, including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc. For Alphabetical List of Advertisers, see page 33.



ACID BRICK

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

ACID EGGS

Chemical Construction Corp., New York City.

ACIDULATING UNITS

Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

AMMO-PHOS

American Cyanamid Co., New York City.

AMMONIA—Anhydrous

Barrett Division, Allied Chemical & Dye Corp., New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA LIQUOR

Barrett Division, Allied Chemical & Dye Corp., New York City
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA OXIDATION UNITS

Chemical Construction Corp., New York City.

AMMONIATING EQUIPMENT

Sackett & Sons Co., The A. J., Baltimore, Md.

AMMONIUM NITRATE SOLUTIONS

Barrett Division, Allied Chemical & Dye Corp., New York City

AUTOMATIC ELEVATOR TAKEUPS

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

BABBITT

Sackett & Sons Co., The A. J., Baltimore, Md.

BAGS AND BAGGING—Manufacturers

Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS—Cotton

Bemis Bro. Bag Co., St. Louis, Mo.

BAGS—Paper

Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS (Waterproof)—Manufacturers

Bemis Bro. Bag Co., St. Louis, Mo.

BAGS—Dealers and Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

BAGGING MACHINES—For Filling Sacks

Atlanta Utility Works, East Point, Ga.
Bagpak, Inc., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

BAG FILERS

Link-Belt Company, Philadelphia, Chicago.

BEARINGS

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

BELT LACING

Sackett & Sons Co., The A. J., Baltimore, Md.

BELTING—Chain

Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BELTING—Leather, Rubber, Canvas

Sackett & Sons Co., The A. J., Baltimore, Md.

BOILERS—Steam

Atlanta Utility Works, East Point, Ga.

BONE BLACK

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Huber & Company, New York City.

BONE PRODUCTS

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

BORAX AND BORIC ACID

American Potash and Chem. Corp., New York City.
Pacific Coast Borax Co., New York City.

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Dickerson Co., The, Philadelphia, Pa.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Keim, Samuel L., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

BUCKETS—Elevator

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

HENRY L. TAYLOR, Broker

Bentley's Code Cable Address "HLTAYLOR"
NORTH CAROLINA BANK BLDG., WILMINGTON, N. C.

Menhaden Fish Products
and
Fertilizer Materials

A Classified Index to Advertisers in
"The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the
Advertisers, see page 33

BUCKETS—For Hoists, Cranes, etc., Clam Shell, Orange Peel, Drag line, Special; Electrically Operated and Multi Power

Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

BURNERS—Sulphur

Chemical Construction Corp., New York City.

BURNERS—Oil

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CABLEWAYS

Hayward Company, The, New York City.

CARBONATE OF AMMONIA

American Agricultural Chemical Co., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.

CARS—For Moving Materials

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CARTS—Fertilizer, Standard and Roller Bearing

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

CASTINGS—Acid Resisting

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Durriron Co., Inc., The, Dayton, Ohio.

CASTINGS—Iron and Steel

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CEMENT—Acid-Proof

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

CHAIN DRIVES—Silent

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAINS AND SPROCKETS

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAMBERS—Acid

Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CHEMICAL APPARATUS

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Durriron Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

CHEMICALS

American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Division, Allied Chemical & Dye Corp., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Huber & Company, New York City.

CHEMICALS—Continued

International Minerals & Chemical Corporation,
Chicago, Ill.

Phosphate Mining Co., The, New York City.
Wellmann, William E., Baltimore, Md.

CHEMICAL PLANT CONSTRUCTION

Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHEMISTS AND ASSAYERS

Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Stillwell & Gladding, New York City.
Wiley & Company, Baltimore, Md.

CLUTCHES

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CONCENTRATORS—Sulphuric Acid

Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CONDITIONERS AND FILTERS

American Limestone Co., Knoxville, Tenn.
Dickerson Co., The, Philadelphia, Pa.
Phosphate Mining Co., The, New York City.

CONTACT ACID PLANTS

Chemical Construction Corp., New York City.

COPPER SULPHATE

Tennessee Corporation, Atlanta, Ga.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

CRANES AND DERRICKS

Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill., and Cedar Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CYANAMID

American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

DENS—Superphosphate

Chemical Construction Corp., New York City.
Stedman's Foundry and Mach. Works, Aurora, Ind.

Andrew M. Fairlie

CHEMICAL ENGINEER

22 Marietta Street
Building ATLANTA, GA.
CABLE ADDRESS: "SULFACID ATLANTA"

SULPHURIC Acid Plants . . . Design, Construction,
Equipment . . . Operation . . . Mills-Packard Water-
Cooled Acid Chambers, Gaillard Acid-Cooled Chambers,
Gaillard Acid Dispersers, Contact Process Sulphuric
Acid Plants.

A Classified Index to Advertisers in
"The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the
Advertisers, see page 33

DISINTEGRATORS

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DRYERS—Direct Heat

Sackett & Sons Co., The A. J., Baltimore, Md.

DRIVES—Electric

Link-Belt Company, Philadelphia, Chicago.

DUMP CARS

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DUST COLLECTING SYSTEMS

Sackett & Sons Co., The A. J., Baltimore, Md.

ELECTRIC MOTORS AND APPLIANCES

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS

Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ELEVATORS AND CONVEYORS—Portable

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial

Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ENGINES—Steam

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

EXCAVATORS AND DREDGES—Drag Line and Cableway

Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link Belt Speeder Corp., Chicago, Ill., and Cedar Rapids, Iowa.

FERTILIZER MANUFACTURERS

American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Farmers Fertilizer Co., Columbus, Ohio
International Minerals & Chemical Corporation, Chicago, Ill.
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

FISH SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

FOUNDERS AND MACHINISTS

Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GARBAGE TANKAGE

Wellmann, William E., Baltimore, Md.

GEARS—Machine Moulded and Cut

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GEARS—Silent

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

GELATINE AND GLUE

American Agricultural Chemical Co., New York City.

GUANO

Baker & Bro., H. J., New York City.

HOISTS—Electric, Floor and Cage Operated, Portable

Hayward Company, The, New York City.

HOPPERS

Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

IRON SULPHATE

Tennessee Corporation, Atlanta, Ga.

INSECTICIDES

American Agricultural Chemical Co., New York City.
McLaughlin Gormley King Co., Minneapolis, Minn.

LACING—Belt

Sackett & Sons Co., The A. J., Baltimore, Md.

LIMESTONE

American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

LOADERS—Car and Wagon, for Fertilizers

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making

Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Duriron Co., Inc., The, Dayton, Ohio.
Fairlie, Andrew M., Atlanta, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Coal and Ash Handling

Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying

Atlanta Utility Works, East Point, Ga.
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Grinding and Pulverizing

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

A Classified Index to Advertisers in
"The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the
Advertisers, see page 33

MACHINERY—Power Transmission

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Pumping

Atlanta Utility Works, East Point, Ga.
Duriron Co., Inc., The, Dayton, Ohio.

MACHINERY—Tankage and Fish Scrap

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MAGNETS

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MANGANESE SULPHATE

McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corporation, Atlanta, Ga.

MIXERS

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

NITRATE OF SODA

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Division, Allied Chemical & Dye Corp., New York City
Bradley & Baker, New York City.
Chilean Nitrate Sales Corp., New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

NITRATE OVENS AND APPARATUS

Chemical Construction Corp., New York City.

NITROGEN SOLUTIONS

Barrett Division, Allied Chemical & Dye Corp., New York City

NITROGENOUS ORGANIC MATERIAL

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., Wilmington, Del.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Smith-Rowland Co., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.

PACKING—For Acid Towers

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

PANS AND POTS

Stedman's Foundry and Mach. Works, Aurora, Ind.

PHOSPHATE MINING PLANTS

Chemical Construction Corp., New York City.

PHOSPHATE ROCK

American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Charleston Mining Co., Inc., Richmond, Va.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
Phosphate Mining Co., The, New York City.
Ruhm, H. D., Mount Pleasant, Tenn.
Schmaltz, Jos. H., Chicago, Ill.
Southern Phosphate Corp., Baltimore, Md.
Taylor, Henry L., Wilmington, Del.
Wellmann, William E., Baltimore, Md.

PIPE—Acid Resisting

Duriron Co., Inc., The, Dayton, Ohio.

PIPES—Chemical Stoneware

Chemical Construction Corp., New York City.

PIPES—Wooden

Stedman's Foundry and Mach. Works, Aurora, Ind.

PLANT CONSTRUCTION—Fertilizer and Acid

Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

POTASH SALTS—Dealers and Brokers

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill.

Jett, Joseph C., Norfolk, Va.

Schmaltz, Jos. H., Chicago, Ill.

Taylor, Henry L., Wilmington, Del.

Wellmann, William E., Baltimore, Md.

POTASH SALTS—Manufacturers

American Potash and Chem. Corp., New York City.
Potash Co. of America, New York City.
Union Potash & Chemical Co., Chicago, Ill.
United States Potash Co., New York City.

PULLEYS AND HANGERS

Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

PUMPS—Acid-Resisting

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

PYRITES—Brokers

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., New York City.
Jett, Joseph C., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

QUARTZ

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

RINGS—Sulphuric Acid Tower

Chemical Construction Corp., New York City.

ROUGH AMMONIATES

Bradley & Baker, New York City.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

A Classified Index to Advertisers in
"The American Fertilizer"

BUYERS' GUIDE

For an Alphabetical List of all the
Advertisers, see page 33

SCALES—Including Automatic Bagging

Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SCRAPERS—Drag

Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

SCREENS

Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SEPARATORS—Air

Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Including Vibrating

Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Magnetic

Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SHAFTING

Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SHOVELS—Power

Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill., and Cedar
Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers

Monarch Mfg. Works, Inc., Philadelphia, Pa.

SPROCKET WHEELS (See Chains and Sprockets)

STACKS

Sackett & Sons Co., The A. J., Baltimore, Md.

SULPHATE OF AMMONIA

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Division, Allied Chemical & Dye Corp., New
York City
Bradley & Baker, New York City.
Huber & Company, New York City.
Hydrocarbon Products Co., New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

SULPHUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Freeport Sulphur Co., New York City.
Texas Gulf Sulphur Co., New York City.

SULPHURIC ACID

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation,
Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.

SULPHURIC ACID—Continued

U. S. Phosphoric Products Division, Tennessee Corp.,
Tampa, Fla.
Wellmann, William E., Baltimore, Md.

SUPERPHOSPHATE

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Minerals & Chemical Corporation,
Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
U. S. Phosphoric Products Division, Tennessee Corp.,
Tampa, Fla.
Wellmann, William E., Baltimore, Md.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
International Minerals & Chemical Corporation,
Chicago, Ill.
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp.,
Tampa, Fla.

SYPHONS—For Acid

Monarch Mfg. Works, Inc., Philadelphia, Pa.

TALLOW AND GREASE

American Agricultural Chemical Co., New York City.

TANKAGE

American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
International Minerals & Chemical Corporation,
Chicago, Ill.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Smith-Rowland, Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

TANKAGE—Garbage

Huber & Company, New York City.

TANKS

Sackett & Sons Co., The A. J., Baltimore, Md.

TILE—Acid-Proof

Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

TOWERS—Acid and Absorption

Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

UNLOADERS—Car and Boat

Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

UREA

DuPont de Nemours & Co., E. I., Wilmington, Del.

UREA-AMMONIA LIQUOR

DuPont de Nemours & Co., E. I., Wilmington, Del.

VALVES—Acid-Resisting

Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Durlon Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

WHEELBARROW (See Carts)

ZINC SULPHATE

Tennessee Corporation, Atlanta, Ga.

ALPHABETICAL LIST OF ADVERTISERS

For Classified Index, see pages 28 to 32, inclusive

- American Agricultural Chemical Co., New York City 3
 American Cyanamid Co., New York City..34
 American Limestone Co., Knoxville, Tenn..18
 American Potash and Chemical Corp., New York City4, 25
 Armour Fertilizer Works, Atlanta, Ga....23
 Ashcraft-Wilkinson Co., Atlanta, Ga.,
 Front cover
 Atlanta Utility Works, East Point, Ga.—
 Bagpak, Inc., New York City—
 Baker & Bro., H. J., New York City,
 Back cover
 Barrett Company, The, New York City—
 Bemis Bro. Bag Co., St. Louis, Mo.....—
 Bradley & Baker, New York City.....12
 Charleston Mining Co., Inc., Richmond, Va. 4
 Charlotte Chemical Lab., Charlotte, N. C....27
 Chemical Construction Corp., New York City25
 Chilean Nitrate Education Bureau, New York City14
 Dickerson Co., The, Philadelphia, Pa.....22
 Dougherty, Jr., E., Philadelphia, Pa.33
 Du Pont de Nemours & Co., E. I., Wilming-
 ton, Del.—
 Duriron Co., The, Dayton, Ohio—
 Fairlie, Andrew M., Atlanta, Ga.29
 Farmers Fertilizer Co., Columbus, Ohio34
 Freeport Sulphur Co., New York City.....16
 Gascoyne & Co., Inc., Baltimore, Md.34
 Hayward Company, The, New York City ..34
 Huber Co., L. W., New York City.....24
 Hydrocarbon Products Co., New York City.15
 International Minerals Chemical Corp., Chi-
 cago, Ill.19
 Jeffrey Mfg. Co., The, Columbus, Ohio....—
 Jett, Joseph C., Norfolk, Va.34
 Keim, Samuel D., Philadelphia, Pa.....33
 Link-Belt Company, Chicago, Ill.—
 McIver & Son, Alex. M., Charleston, S. C..26
 McLaughlin Gormley King Co., Minne-
 apolis, Minn.—
 Monarch Mfg. Works, Inc., Philadelphia,
 Pa.34
 Pacific Coast Borax Co., New York City,
 2d cover
 Phosphate Mining Co., The, New York City —
 Polk Co., R. L., Detroit, Mich.....—
 Potash Co. of America, New York City,
 3d cover
 Ruhm, H. D., Columbia, Tenn.34
 Sackett & Sons Co., The, A. J., Baltimore,
 Md.—
 Schmaltz, Jos. H., Chicago, Ill.27
 Shuey & Company, Inc., Savannah, Ga.34
 Smith-Rowland Co., Norfolk, Va.—
 Southern Phosphate Corp., Baltimore, Md. 27
 Stedman's Foundry and Machine Works,
 Aurora, Ind.20
 Stillwell & Gladding, New York City—
 Synthetic Nitrogen Products Co., New York
 City—
 Taylor, Henry L., Wilmington, N. C.28
 Tennessee Corporation, Atlanta, Ga.—
 Texas Gulf Sulphur Co., New York City..—
 Union Potash & Chemical Co., Chicago, Ill..21
 U. S. Phosphoric Products Division,
 Tennessee Corp., Tampa, Fla.25
 United States Potash Co., New York City..17
 Wellmann, William E., Baltimore, Md.27
 Wiley & Company, Inc., Baltimore, Md.34

SAMUEL D. KEIM

By-Products and Fertilizer Materials

(SINCE 1898)

1612 MARKET STREET
PHILADELPHIA, PENNA.

E. DOUGHERTY, JR., Manager

MONARCH SPRAYS



This is our Fig. 645 Nozzle. Used for Scrubbing Acid Phosphate Gases. Made for "full" or "hollow" cone in Brass and "Everdur." We also make "Non-Clog" Nozzles in Brass and Steel, and Stoneware Chamber Sprays now used by nearly all chamber spray sulphuric acid plants.

CATALOG 6-C

MONARCH MFG. WORKS, INC.

Westmoreland and Emery Sts., Philadelphia, Pa.

FOR SALE

UP TO 5,000 ACRES OF TENNESSEE
PHOSPHATE LANDSMineral Rights or Fee Simple
BEST AND SAFEST PLACE TO INVEST
IDLE MONEY

H. D. RUHM

COLUMBIA, TENN.

SHUEY & COMPANY, Inc.

Specialty: Analysis of Fertilizer Materials and Phosphate Rock. Official Chemists for both Florida Hard Rock Phosphate and Pebble Phosphate Export Associations. Official Weigher and Sampler for the National Cottonseed Products Association at Savannah; also Official Chemists for National Cottonseed Products Association.

115 E. BAY STREET, SAVANNAH, GA.

JETT
—
BROKER

ALL FERTILIZER MATERIALS

FISH SCRAP for Fertilizer and Fish Meal for Feed, Nitrate of Soda, Sulphate of Ammonia, Potash Salts, Superphosphate (Acid Phosphate), Meals, South American and Domestic Tankage and Blood, Foreign Fish Guano.

JOS. C. JETT

Board of Trade
Building

NORFOLK, VA.



Steer Clear of Conditioning Troubles

Neutralize Free Acid with

'Aero' Cyanamid**WILEY & COMPANY, Inc.**Analytical and Consulting
Chemists

BALTIMORE, MD.

26 times every year "The American Fertilizer" records the progress and happenings of the fertilizer industry.
\$3

will bring you these 26 numbers.

Where can you make a better investment?

Ware Bros. Company, Publishers, Phila.

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

Hayward Buckets



Use this Hayward Class "K" Clam Shell for severe superphosphate digging and handling.

THE HAYWARD CO., 202 Fulton St., New York



The Farmers Fertilizer Co.

Manufacturers

COMPLETE FERTILIZERS

BULK SUPERPHOSPHATE

SULPHURIC ACID

Acid plant capacity, 45,000 tons. Fertilizer plant capacity, 50,000 tons

Get in touch with us.

COLUMBUS, OHIO

GASCOYNE & CO., INC.

Established 1887

Chemists and Assayers

Public Weighers and Samplers

27 South Gay Street - BALTIMORE, MD.

Knowledge OF AGRICULTURAL CHEMISTRY, SOILS, MANURES, etc., is essential to manufacturers of Commercial Fertilizers :: Books covering these subjects may be obtained from

WARE BROS COMPANY

1330 Vine St., Philadelphia

P.C.A. Red Muriate is ideal in your plant
operation--Uniform in color--Uniform
in analysis--Uniform in grain size.

Granular Muriate of Potash
Muriate of Potash 50% and 60%
Manure Salts



POTASH COMPANY
of America

GENERAL SALES OFFICE 50 BROADWAY NEW YORK CITY

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

91 YEARS OF SERVICE



H. J. BAKER & BRO.

271 Madison Ave., NEW YORK

BALTIMORE - CHICAGO - SAVANNAH - TAMPA

Sole Distributors of

DRIED ACTIVATED SLUDGE
SANITARY DISTRICT of CHICAGO

IMPORTERS

EXPORTERS

POTASH SALTS
SULPHATE of AMMONIA
NITRATE of SODA
PERUVIAN BIRD GUANO
FISH MEAL, BONE MEAL
TANKAGE, BLOOD
NITROGENOUS
AND ALL OTHER
FERTILIZER MATERIALS

MENTION "THE AMERICAN FERTILIZER" WHEN WRITING TO ADVERTISERS.

